

77. The system of claim 74 wherein said visual display is a video monitor.

CH 78. The system of claim 72 or 73 wherein said a stationary x-ray source emits at least one fan beam of x-ray radiation.

79. The system of claim 72 or 73 wherein said ensemble comprises an article of luggage and said system further comprising a conveyor adapted to move said luggage past at least one fan beam radiating from said X-ray source.

80. The system of claim 72 or 73 wherein said X-ray detector includes at least one linear array of detectors.

81. The system of claim 71, 72 or 73 wherein said X-ray source is adapted to emit dual energy X-ray radiation and said X-ray detector is adapted to detect separately at each energy x-ray radiation transmitted through the ensemble of objects and produces dual energy transmission data related to said target material and said computer employs said dual energy data for determining said values of the property of said target material.--

REMARKS

Applicants have canceled claims 1 and 60, and amended method claims 57-59, 61 and 63-69 to clarify the distinctions between the prior art and the claimed invention. Applicants have

also added claims 70- 81. Prior to the above amendments, the Examiner rejected claims 57 and 59-66 under 35 U.S.C. § 103 as unpatentable over Annis (U.S. Patent No. 5,022,062) and claims 1, 67-69 under 35 U.S.C. § 103 as unpatentable over Annis in view of the Alvarez. Applicants respectfully disagree with these rejections and show below how the teaching of Annis alone, or in any proper combination with Alvarez, fundamentally differs from the claimed subject matter.

The invention under consideration is a system or a method for detecting a specific given material that may be present in an ensemble of objects in which different materials may overlies or underlies the given material. Regions of the ensemble of objects are exposed by a stationary x-ray source and the transmitted x-ray radiation is detected, for each region, by a stationary x-ray detector. A computer stores the detected data representing attenuation of the transmitted x-ray radiation for each exposed region of the ensemble. For each region under consideration, the computer determines a value of a property (for example, Z) of an unknown target material present in the region by substantially removing the contribution of underlying or overlying material to said value, wherein the contribution of the underlying or overlying material, for the region under consideration, is determined from the attenuation data from regions adjacent to the region under consideration. The computer then compares the determined value of the property of the target material in the region to a known value of the property of the given material and highlights, on a display, locations in an

image based on these comparisons to indicate to an operator possible presence of the given material in the ensemble of objects.

The above invention is not described or even suggested by Annis. The system of Annis operates in a completely different way than the invention. Annis does not remove the contribution of the underlying or overlying material in the attenuation data for a given region under consideration. The threat characteristic, produced from the backscattered histograms, or the visual display data of Annis can not be equated with the claimed invention.

Annis irradiates the examined object and detects transmitted X-ray radiation using a transmit detector 50 and back scattered radiation using a back scatter detector 25A and 25B. Scatter electronics 251, connected to the scatter detector 25A and 25B, generates a digital backscatter image. "The digital backscatter image is processed to produce a histogram. The histogram is compared to a predetermined threat characteristic and an alarm is sounded if the histogram exceeds the threat characteristic. The threat characteristic is derived in an empirical fashion and automatically modified based on sensing selected parameters associated with the scanning." (Abstract)

Specifically, in Annis, the "threat characteristic is experimentally established over a relatively broad range of backscatter signal intensities or pixel values. The threat characteristic (for the cumulative histogram) is a monotonically decreasing line of demarcation when plotted in a plane of number

of pixels vs. pixel intensity, as is seen for example in FIG. 3. The threat characteristic can be stored in the scatter electronics 251..." (Col. 7 lines 50 through 57, emphasis added) The system of Annis scans the examined object and the scatter electronics 251 creates a histogram. "[T]he resulting histogram is compared against the threat characteristic at each of a plurality of pixel intensity values. If at any one of these values the histogram produces by scanning the object and processing the pixels exceeds the threat characteristic for the corresponding pixel intensity, then a first criterion of threat processing is satisfied." (Col. 7 line 66 through col. 8 line 4) This "initiates the second criterion of threat detection - the visual observation of the resulting display by the operator." (Col. 8 lines 22 through 24)

Nowhere does Annis describe or even imply the claimed material detection based on the value of a property (for example, Z) of an unknown target material determined by substantially removing the contribution of underlying or overlying material from the attenuation data of transmitted X-rays. Applicants respectfully disagree with the Examiner's statement that "the processing data [of Annis] would have been in a manner not significantly influenced by the underlying or overlying material." Annis does not teach removal of the underlying or overlying material values either in his histograms assembled from the X-ray radiation backscattered from the examined suitcase 40 or in his visual scan data. The detection concepts of Annis and

of the invention claimed in independent claims 56 and 71 are fundamentally different.

Alvarez does not describe the invention as claimed in independent claims 56 and 71 nor does he teach anything that, when read together with Annis, would render the invention obvious because Alvarez does not teach the claimed features not found in Annis.

Therefore, independent claims 56 and 71 are patentable over Annis alone, or Annis in any proper combination with Alvarez. Method claim 69 includes all limitations of claim 56. The remaining claims 57-70 and 72-81 are properly dependent on claims 56 and 71, respectively and are thus allowable therewith.

Accordingly, all claims are submitted to be in condition for allowance and such action is respectfully requested.

Enclosed please find a check in the amount of \$209.00 for the new claims, a Supplemental Information Disclosure Statement and a Petition for Extension of Time. Please apply any

other charges or any credits to our deposit account number 06-1050.

Respectfully submitted,

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